

sally which Sterry Hunt made some time ago in the 'American Journal of Science' on those holding "extravagant views" of pseudomorphism—"In this way we are led from gneiss or granite to limestone, from limestone to dolomite, and from dolomite to serpentine"*², and so on.

We are glad, however, to welcome our opponent as a member of the pseudomorphic corps, which we cannot but think will be all the stronger for his membership.

Still, in the face of a fact of common occurrence to us, Dr. Dawson states that "in no instance" had he observed the "nummuline layer to pass into chrysotile," as it has been represented by us; but it is remarkable that in the specimen above noticed a *portion* of the same layer ("walls of the skeleton") is "represented" by "serpentine" (incipient chrysotile we have no doubt) with "traces" of the tubuli ("canals"), and that it becomes completely changed into true nummuline tubulation ("is clearly traced into connexion with" other portions "still existing as calcite")!

Dr. Dawson, after stating that he has not seen "the chevron arrangement" represented in "fig. 7" of our plate in the 'Annals' for October 1874, mentions that "Mr. Weston was struck with the inaccuracy of the representations in this plate." We could excuse either party for expressing his doubts; but the charge of "inaccuracy" is so plainly made that it must not be passed over. We cannot accept statements unless they are made *in propria personâ*. This has not been done by Mr. Weston; therefore, although we should be glad to have the reasons of one "who has prepared and examined microscopically hundreds of specimens of *Eozoon*," we must call upon Dr. Dawson to publish *his* reasons as to wherein lies "the inaccuracy of the representations in this plate." Meanwhile, we may declare in the most emphatic manner that in *every essential point our "representations" are accurate.*

XXXIX.—Notes on the Mode of Propagation of some Ceylonese Tree-Frogs, with Description of two new Species. By Dr. ALBERT GÜNTHER, F.R.S., Keeper of the Zoological Department, British Museum.

[Plate XX. fig. C.]

OUR knowledge of the mode of propagation of extra-European Batrachians is restricted to a very small number of species; and from the few singular facts with which we have become acquainted, we may expect that most interesting dis-

* 'Chemical and Geological Essays,' p. 287.

coveries will be made by naturalists who have the opportunity of observing these animals in their native countries. The statement of Bello y Espinosa *, that the young of some frog in Porto Rico, called "co-qui" by the inhabitants, do not pass through a metamorphosis, but are provided with four legs and are air-breathers when hatched, is deserving of accurate inquiry, as it seems that in this frog, which is, perhaps, a species of *Hylodes*, the embryo passes through that part of the metamorphosis that is generally undergone by the tadpole in water, in the ovum itself. The observation of A. W. Aitken †, that in tropical parts of Australia certain frogs form a hollow ball of clay, containing about half a pint of clear cold water, in which they sojourn during the drought, is probably also indicative of a provision to secure the safety of the spawn and young. In other tropical countries frogs have been observed to deposit their spawn in small accumulations of water formed in the hollows of trees or branches. Some years ago Mr. E. W. H. Holdsworth, F.L.S., brought me from Ceylon, preserved in spirit, a rounded, flattened, spongy-looking soft object, of the size of a crow's egg, which he believed to be the spawn of some tree-frog. He informs me that he "found this specimen hanging from the side of a stone cistern in the garden at the Governor's house at Kandy; it was about 8 inches from the surface of the water, which was at its usual height in the cistern." The lump is of an indistinct greenish colour, elastic, and offering the same resistance to the touch as the lung of a reptile, which it resembles in the reticulated, vesicular appearance of its surface. On making an incision we find it to consist of an interlaced tissue enclosing larger and smaller vacuities which may have been filled with air or water. A few lines below the surface the ova are found, some lodged in meshes of the tissue, others accumulated towards the centre of the lump. The ova appear now as brown globules of the size of a large pin's-head. A second lump of spawn, of precisely the same shape and size as the first, was more recently sent by Mr. Bligh to Mr. Holdsworth, who kindly gave it to me. This specimen was accompanied by a great number of minute greenish tadpoles and two fully adult specimens of *Polypedates maculatus*. Although I have no doubt that the tadpoles are of the same origin as the spawn described, I do not believe that either is the product of that species, the ova of which, when mature, are at least twice the size of those deposited in the spawn-lump. I am rather in-

* Zoolog. Gart. Frankf. 1871, p. 351.

† Trans. New-Zeal. Inst. ii. 1870, p. 87.

clined to suppose that a species of *Ixalus* will be found to be the progenitor.

So much is evident, that the mass enveloping the ova of this frog offers a much greater protection against mechanical agencies than the gelatinous substance of the common frog-spawn; but whether the cells below its surface contain air, to keep the whole body floating on the water, or whether they contain water, to supply the embryos with the necessary moisture if the spawn remain normally out of the water, is uncertain at present.

Quite recently an instance of a tree-frog carrying its spawn about with it has come under my observation (see Pl. XX. fig. C). In a small collection of Ceylonese frogs submitted to my examination by Mr. W. Ferguson, F.L.S., there was a frog which I consider to be *Polypedates reticulatus*, and which had the ova attached to the abdomen when that gentleman obtained it. The ova are now detached, but still firmly adhere to one another, forming a flat disk. They have left shallow impressions in the skin of the abdomen of the adult frog, corresponding to the arrangement of the ova in the disk, but not deep enough to efface the granulations of the skin. The ova are only twenty in number, of large size, viz. of the size of a hemp-seed. The adult frog is a female, with a body scarcely 2 inches long, and with the internal signs that the ova have been but recently excluded. Unfortunately we do not know whether the specimen was caught in or out of the water.

None of the other Batrachians which are known to take care of their progeny resemble *Polypedates reticulatus* in this respect. *Pipa*, *Nototrema*, and *Opisthodelphys* carry their ova on the back; and in *Alytes* it is the male which takes care of the spawn. In our Ceylonese frog the mode of attachment is perfectly identical with that which I described in the Siluroid genus *Aspredo* (Fish. v. p. 268).

I trust that these notes, fragmentary as they are, yet contain matter of sufficient interest to induce naturalists resident in Ceylon to continue and complete these observations.

I take this opportunity of adding the descriptions of two new species of *Ixalus* from Ceylon.

Ixalus Fergusonii.

Similar in habit to *I. variabilis*. Snout rather flat, short, pointed in front, with short but distinct canthus rostralis, and with the loreal region subvertical. Eye of moderate size; tympanum hidden. Upper parts smooth; abdomen coarsely granulated. Metatarsus without fringe or fold, and with a

single tubercle. Fingers not webbed; toes broadly webbed. Disks well developed. The length of the body equals the distance of the vent from the heel. Upper parts of a greenish white, with small black or brownish specks irregularly disposed; hinder part of the thigh not coloured; lower parts white.

Two specimens, presented by W. Ferguson, Esq., F.L.S.; the larger is 26 millims. long, the hind limb being 40 millims.

Ixalus hypomelas.

Snout not flattened, of moderate length, somewhat rounded in front, with distinct canthus rostralis, and with the loreal region subvertical. Eye of moderate size; tympanum hidden. Skin smooth. Metatarsus without fringe or fold, and with a single tubercle. Fingers not webbed; web of the hind foot rudimentary. Disks rather small. The length of the body is scarcely equal to the distance of the vent from the heel. Coloration varies: the most characteristic form is chocolate-brown above, with the sides and lower parts black, spotted with white; a fine white line runs along the middle of the back and of the abdomen, beginning from the snout, the abdominal line being frequently crossed by another white line, running from one fore leg to the other; metatarsus with a white line along its outer margin. All or some of these lines may be absent. Sometimes the upper parts are dark purplish (the snout being of a lighter colour) or purplish grey mottled with brown. In one variety, in which all the white lines are absent, the upper part of the snout as well as of the forearm is of a uniform greyish-white colour.

The largest of several specimens is 22 millims. long, the hind limb being 35 millims. We have received specimens of this species in Col. Beddome's and Mr. Ferguson's collections.

XL.—*Remarks on Mr. Carter's Paper "On the Polytre mata, especially with reference to their Mythical Hybrid Nature."*
By WILLIAM B. CARPENTER, M.D., F.R.S.

HAVING been prevented by absence on the Continent from perusing Mr. Carter's paper at the time of its publication, I take the earliest opportunity in my power of expressing the great interest with which I have read it, and my entire concurrence in that part of it which relates to the "mythical hybrid nature of *Carpenteria*." It was scarcely to be expected that when I first drew attention to the singularly aberrant